



A holistic approach to energy saving

The Covid-19 breakout and subsequent lockdowns have been a reality for the UK for more than a year now. Many of us, from office workers to children and students were forced to move our operations into our homes. This change has left most public buildings empty, which in theory should mean less overall energy utilisation. But did you know that **40%** of all energy usage happens at night, when nobody is in anyway? Here at **Chauvin Arnoux**, we take a holistic approach to energy saving, so in this article we come to the aid of facilities managers by showing them the best ways of keeping on top of energy costs effectively.

Energy management tips

For many organisations, lighting is perceived as a tiny fraction of their energy bills, but in reality, it actually accounts for up to 40% of a building's electricity consumption. One very effective way of creating savings in this department is to switch to LED light sources, which use 80% less energy than incandescent lamps for the same light output.

Another important issue that involves heating and office equipment is out-of-hours usage. A recent British Gas survey of 6,000 small- and medium-sized businesses that had smart meters found that no less than 46% of their energy use was outside their normal business hours, and there's no reason to believe that the figure would be significantly different for public sector organisations. Some out-of-hours energy use is of course, necessary and unavoidable, but once non-essential usage has been identified, big savings can often be achieved by measures as simple as installing time switches.



Space heating and environmental conditions

Motors consume about two-thirds of the energy used by UK industry. Of course, your organisation may not be industrial and, therefore, it would be easy to assume you don't need to worry about motors. Yet motors are everywhere, not least driving fans in air-conditioning systems and pumps for boilers and water supply. If they were installed a while ago, chances are that those motors have ordinary starters which means the motors are either stopped or running at full speed. This can be very wasteful.



Most fans in air conditioning systems only need to operate at full speed on a few really hot summer days. For the rest of the year, their speed could be reduced to 80% or less, without affecting building comfort levels. And this would mean big savings, because at 80% of full speed, a fan uses only 50% of the energy it uses at full speed. Fitting variable speed drives that will allow speed to be continuously controlled from zero to maximum is therefore a very worthwhile investment.



Looking after the planet

Good ventilation, or at least good circulation of air, is necessary to prevent the build-up of carbon dioxide, but also necessary during the pandemic. But a poorly designed ventilation system can lead to draughts that unnecessarily remove heat from the building. The solution is to monitor airflow, carbon dioxide levels, temperature and humidity. The information provided by them will allow air quality to be optimised while minimising unnecessary loss of heat.

Case study: saving energy in a typical school

When invited to help create an energy strategy at a secondary school in Kent, the Chauvin Arnoux team started by logging the usage readings over an eleven-day period, which also included the half term holidays, a week of term time and a weekend. What they found was that the total energy consumed in the period came to just over £2,000, which meant an annual electricity bill of around seventy thousand pounds. But even at the weekend, when there was no activity on the premises, there was still a load of around 30 A per phase.



Another important finding from the investigation was that harmonics were unexpectedly high, which is actually a common problem given the proliferation of non-linear loads in our fast-moving technological world. In this case, the data showed that the third- and fifth-order harmonics were dominant. Third-order harmonics are typically caused by personal computers, office equipment and electronic lighting, while in this installation the fifth-order harmonics were probably being caused by servers and UPS systems. The easiest solution to this problem was to simply educate staff to turn off lighting and equipment at the end of the day or even install systems to turn it off automatically.

Final words

The pandemic has brought many changes for all of us, and in virtually all industry sectors. However, saving money, reducing energy consumption and supporting the environment, are more important than ever. The one common thread that unites all effective methods of energy management is the need to measure – after all, what doesn't get measured, doesn't get managed! So make sure to call on the experts at Chauvin Arnoux and follow their tips on holistic energy saving solutions for your organisation!



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